GEOGRAPHIC

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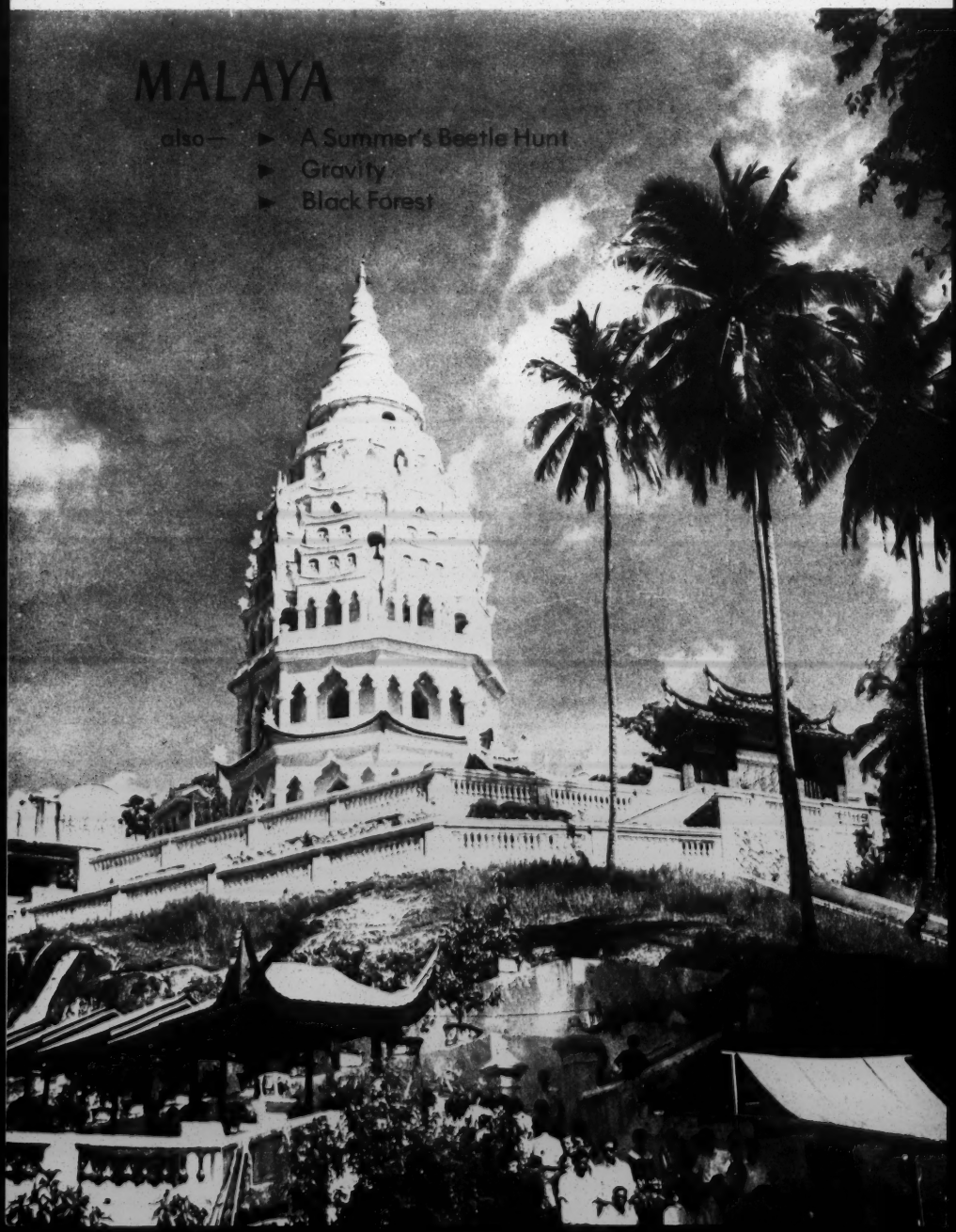
OCTOBER 17, 1960, VOLUME 39, NUMBER 3 . . . *To Know This World, Its Life*



MALAYA

also—

- A Summer's Beetle Hunt
- Gravity
- Black Forest

UMI

boost Malaya. Tin miners first brought their ore to port towns as early as the 17th century, but there was no demand for the metal then, and disease discouraged more jungle ventures.

Today Malaya is the world's largest producer of tin. Tin-bearing rock runs throughout the length of the peninsula. In manmade pits, workers like the one above hose earth banks with powerful jets of water, loosening ore-bearing material. The muddy water is pumped through a sluice where low cross boards every few feet catch the ore. Each day Americans use tin from this mine or others like it. We open cans of tin-plated steel, pour tea from pewter pots (pewter is an alloy made with tin), join metals with solder of lead and tin, take candy from tinfoil.

Trade combines with rubber and tin to give Malaya an importance out of proportion to its size. The country is not quite as big as Florida. Four-fifths is steaming jungle. Mountains, some more than 7,000 feet high, march down the middle of the country, leaving only a narrow, U-shaped section of coastal plains. But the peninsula's location, between the Straits of Malacca on the west and the South China Sea on the east, has kept Malaya on traders' maps for as long as ships have sailed between India and China.

The first settlements sprouted along the coast. Malays, racially related to Indonesians and Filipinos, arrived on the peninsula possibly 4,000 years ago. They planted forest clearings and fished in the many rivers that gush from the mountains. As they pushed upriver, they forced the original inhabitants deep into the jungle. Some 40,000 of these primitive people are isolated there today.

River and coastal regions spawned Malay ports where 2,000 years ago Indian merchants arrived to trade textiles, iron tools, and beads for Malayan gold and forest products.

Malaya's position on the funnel to the Far East made it a prize coveted by other countries. First the Portuguese, then the Dutch took Malacca, then Malaya's chief port. The British wrested it from the Dutch and took over the rest of the peninsula in the 19th century. In 1957 the territory was given independence by Great Britain. It became the Federation of Malaya, a constitutional

NATIONAL GEOGRAPHIC MAP

Asia's jeweled pendant—Occupying the end of the Malay Peninsula, the state of Malaya reaches mainland Asia's southernmost point. Within its 50,700 square miles lie mountain jungles broken by wild rivers rushing to the sea. Behind the palm-fringed beaches rise bustling towns and idyllic thatch-roofed villages—all bathed in a climate of eternal summer broken only by cooling monsoons.

UMI

NATIONAL GEOGRAPHIC PHOTOGRAPHER JOSEPH BAYLOR ROBERTS

Tin, Rubber, and Trade Put Malaya on the Map

When Tunku Abdul Rahman Putra, Prime Minister of the Federation of Malaya, marks the high points of his trip to the United States (which begins October 25), he will perhaps draw a star opposite Akron, Ohio.

For Akron is the largest rubber manufacturing center in the world. Here the prime minister will see rubber from Malaya converted into tires and tubes in some of the world's largest plants.

At home in Malaya he has often seen the beginning of these tires. He has visited the big rubber estates where half Malaya's rubber is grown. He has watched men bringing in pails of the liquid latex which they drew from the sapwood of regiments of trees on the big plantations.

And he has no doubt watched the small planter tap the trees in the orchard behind the home. In the United States the prime minister will see the large-scale conversion of his Malayan planters' products into useful goods.

He can see rubber products manufactured in Malaya, too. The girl above puts a rubber sole on a canvas shoe in a factory in the state of Selangor. She assembles about 60 pairs a day. Her factory also makes industrial and hospital rubber goods, rubber bands, and bicycle tires, consuming about 12 tons of rubber a month.

Rubber, planted about 1890 by British growers discouraged by the failure of their coffee crop, helped turn Malaya into a boom nation. The country today is second only to Indonesia in the production of rubber.

Rubber is not the only industry to

MALAYAN EMBASSY, BELOW AND COVER

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Malayan contrasts—The fishing village above rides on bamboo rafts. Nursing school below is modern by any standard.

market their catches by the waterside.

Some 600 years ago Islam, the religion of Mohammed, spread along the Southeast Asian trade routes, and most Malays today are Moslems.

Out of this mixture of Chinese, Indians, and Malays, a modern state rises.

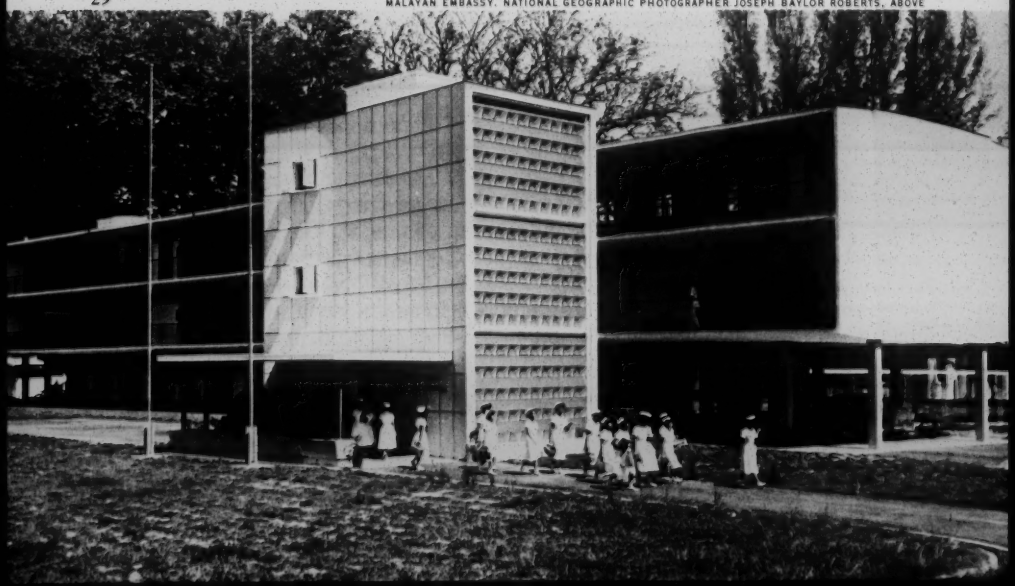
The capital, Kuala Lumpur (muddy mouth), began in 1859 as a tin-mining settlement at the junction of two rivers. Its name shrank to a colloquial "K.L." but the city grew. Today modern steel and glass buildings rise among mosques and temples. The city boasts modern hotels, handsome suburbs, and imposing government buildings whose sparkling gold, white, and blue domes reflect the influence of Islam. New cars and double-decker buses dominate the avenues.

A city of 340,000 people, Kuala Lumpur is still growing. Workers labor day and night to put up new buildings.

Although Singapore is politically separated from the Federation, it remains geographically part of it. The harbor is the main outlet for Malayan trade. American, European, and Asian ships dock there to unload their steel, automobiles, machines, textiles, dairy products, and chemicals. They steam away loaded with the riches of the tropics: palm oil, copra, pepper, tea, forest products—and, of course, tin and rubber.

L. B.

MALAYAN EMBASSY, NATIONAL GEOGRAPHIC PHOTOGRAPHER JOSEPH BAYLOR ROBERTS, ABOVE



UMI

MALAYAN EMBASSY

Saronged Malayan dancers squat and clap in the Roŋggeŋ, a popular festival dance

monarchy within the British Commonwealth. Singapore, an island off the southern tip of the peninsula, remained under British rule until 1959 when it became an independent state within the Commonwealth, but still separate from the Malayan Federation.

During World War II, control of Singapore gave Japan the key to all of Southeast Asia. More recently Communist Chinese guerillas terrorized Malayan rubber planters and villagers in an unsuccessful attempt to control this valuable piece of real estate.

Over the decades, the trio of tin, trade, and rubber drew hordes of immigrants to the sparsely settled country. Labor was needed to work the mines and tap the rubber trees.

Indians from overcrowded farms in the southern part of their country came to work the rubber plantations. Other Indians came to trade. Chinese laborers flocked to the tin mines. Merchants opened shops in the towns. Farmers arrived on pineapple estates and truck farms.

Most intended to stay only long enough to make their fortunes and return to their homeland. But many remained to make Malaya a melting pot of Asian culture. They built their own schools, taught their own religions and languages.

Today Chinese represent about 37 per cent of Malaya's 7 million people; Indians, about 11 per cent.

Evidence of these large minorities is everywhere. Chinese worship in the Buddhist temple on the cover, Kek Lok Si, on the island of Penang. Shops with Chinese characters over their doors line city streets. Chinese junks jostle in Malayan harbors.

Tall-turbaned Sikhs from India mingle with sarong-clad Malays on city streets where Hindu temples rise.

Although some have gone into industry and government service, the Malay usually prefers the quiet life of a small village with orchards, vegetable gardens, and the ever-present rice paddy. He cuts his harvest a stalk at a time so as not to irritate the spirit of the rice.

Villages of houses on stilts stand on the outskirts of cities, on streams, rivers, and on the Malayan coasts. Fishing fleets sail from shore early in the morning, returning in the evening to

"I took this picture when we pitched camp in an arroyo at the base of a mountain in Arizona. The walnut trees gave us a little protection from the hot sun. Just beyond our grove stretches the desert (below), with stands of cactus, mesquite, greasewood, and fragrant creosote bush. That's Mother and Dad and some of my brothers and sisters in the camping shot. With a large family like ours, we always have plenty of hands for chores."

CARL R. MARKWITH, MICHAEL ARNETT, ABOVE

the oxacis and other specimens out of the jars, makes notes, and mounts them for classification. When Dad started classifying the oxacis 10 years ago, only eight species were known; today he has identified 44 species.

When the beetles are catalogued, and the camping chores done, there is time to study the ways of the desert. You quickly learn to wear long pants to protect your legs from cactus, and a shirt to cover your shoulders from the sun. We enjoyed the fruit of the prickly pear cactus for breakfast. You put on a pair of gloves and peel off the spiny skin. Then you put sugar on the pink fruit and eat it. It tastes a lot like a peach.

The Sonoran Desert is anything but deserted. One day Ross and I explored a canyon where cattle rustlers once hid out. I saw eagles swooping into a gulch, and almost stepped on a rattlesnake.

At night animal sounds can send a chill running up your spine. Porcupines rattled the garbage cans. A bobcat came into camp one night, but the dog scared him away. Coyotes whined nearby, and the next morning we saw their tracks.

It's kind of eerie—but fun. And I like the feeling of contributing to science. I hope Dad needs me next summer.

UMI

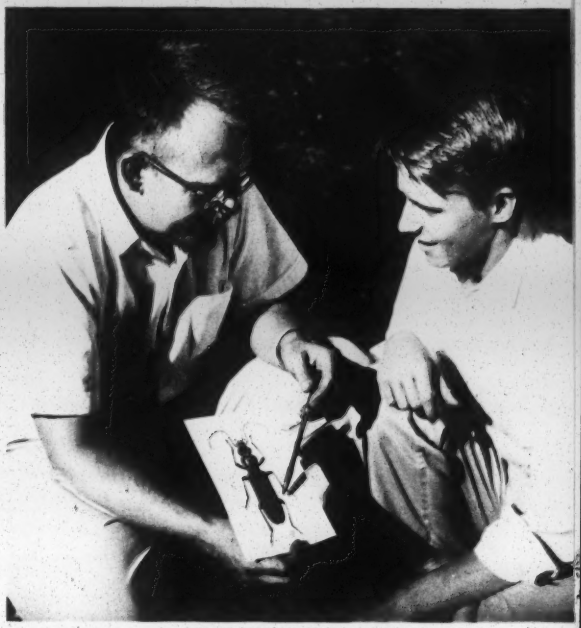
Collecting Beetles in Arizona's Desert

By Michael Arnett

SOMEWHERE in southern Arizona there lives a beetle named for me.

It's a tiny beetle—no bigger than the end of your little finger. But I get a thrill every time I see its name in one of my father's scientific papers: *Oxacis michaeli* Arnett.

The name is Latinized, of course. Zoologists like my father give Latin names to species they discover. He named this one after me because it is reddish brown, the color of my hair. That's an enlarged drawing of it in the picture.



ARTHUR P. MILLER, JR., SCHOOL BULLETINS STAFF

Michael Arnett, 15, a 10th grader at Archbishop Carroll High School, Washington, D.C., listens as his father, Dr. Ross H. Arnett, Jr., describes an oxacis beetle. Author of 60 papers and two books on beetles, Dr. Arnett is associate professor of biology at Catholic University.

Small as it is, this beetle and its cousins have drawn our family 2,100 miles across the country the last four summers to the Sonoran Desert, along the border between Arizona and the state of Sonora, Mexico.

Beetles, I've learned, are important. Dad says there are about a million different kinds of organisms—plant and animal—on Earth, and 25 per cent of them are beetles. He concentrates on the oxacis because of its fascinating life history. It breeds in the Chiricahua Mountains, then follows the summer rains through five "life zones" to the desert floor.

What we learn about the oxacis may help other biologists as well. The data we collect in our notebooks might enable others to draw new conclusions in their specialties, thus adding to the sum of human knowledge.

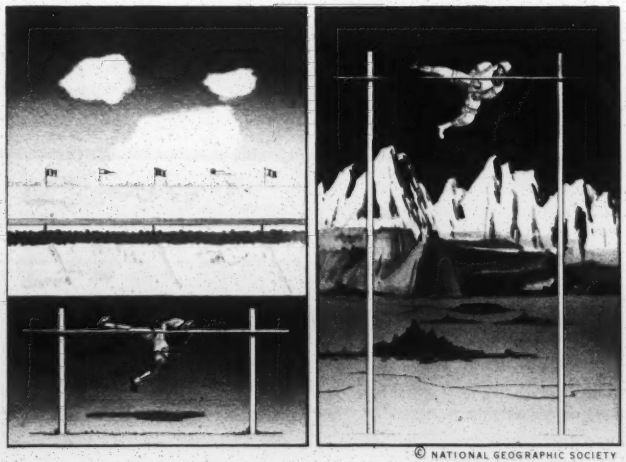
As soon as classes ended last June, we all piled into the one-ton truck that Dad, my brother Ross, and I had converted over the winter into a rolling dormitory. In it are bunks for all ten of us, shelves for food, coolers for water, a camp stove, and refrigerator.

Once in Arizona, we don't stick to the main roads; so our "camper" is built for rough duty. We drive right across the desert, through mesquite and cactus, wherever Dad finds good beetle-hunting ground.

Oxacis beetles live on prickly pear in the desert and spirea in the mountains. When we find a shady arroyo, preferably one with a stream, near these plants, we stop and pitch camp. After supper, Dad and Ross and I hang a large sheet on the truck. On a pole we hang a gas lantern. The light attracts many insects, including some oxacis. We pluck them off the sheet and drop them in a mayonnaise jar half filled with sawdust, plaster of paris, and deadly cyanide crystals.

When the beetle collecting is good we work until late at night. Dad takes

support him.



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Gravity is stronger on larger celestial bodies, weaker on small ones. A high jumper who could leap six feet on Earth (left) would top 36 feet on the moon (right), disregarding the clumsy space suit. On Mars he could reach 16 feet, but on huge Jupiter only 2½ feet.

Today the search for better understanding of gravity is intensified because it is the first barrier to space flight as well as missile launching. The dream of researchers is to find some way of overcoming one of gravity's most interesting properties—there is no shield against it. The entire Earth cannot stop it. The pull of the moon is felt on the opposite side of Earth as well as directly under it. If some means of neutralizing gravity were found, it would bring a revolution in human life far exceeding that created by atomic power. Space ships could simply float up from Earth, without spectacular—and expensive—rocket engines. Cargo and passenger vessels could float along in air like ships in water, making transportation unbelievably cheap and easy.

PAUL A. ZAHL, NATIONAL GEOGRAPHIC STAFF

Scientists around the world work toward more precise measurement of gravity. There is scholarly speculation that gravity today is becoming weaker. If true, we are all losing weight in the easiest way—although the bathroom scale wouldn't show it. Over a year the decrease would be far less than a millionth of a pound.

Weaker gravity would mean a larger Earth, with its circumference growing slightly each year, widening cracks in the surface. The argument is strengthened by the recent discovery that one single fracture, 45,000 miles long, encircles the globe. F. S.

Tidal bore, a rippling wall of water, rushes inland (toward the left) in a Bay of Fundy estuary. The moon's gravitation lifted this water from the Atlantic Ocean, and dragged it toward shore. The moon not only makes the ocean tides, but pulls the atmosphere and the land itself.

UMI

The Riddle of GRAVITY

Universal Force Still Unexplained

NATIONAL GEOGRAPHIC PHOTOGRAPHER KATHLEEN REVIS

Speed and the up-curve of the ski jump have combined to fling this skier aloft, for an instant defying gravity. Now, however, the pull of Earth reasserts itself and soon the thrilling flight will end in a crunching landing.

Gravity, probably noticed by the earliest man, is still a mystery. Science knows how it operates, but not why. In its simplest description, gravitation is the attraction all matter has for all other matter. Earth not only is pulling the skier toward it, but the skier, to a minute degree, is pulling on Earth.

If you release your hold on this magazine, it will fall to the floor—but at the same time, it exerts an extremely slight upward pull on the floor. In the same way, all matter in the universe—from the penny in your pocket or a grain of sand on the beach to the farthest star in the farthest galaxy—affects all other matter.

Scientists distinguish between gravity and gravitation. Gravitation is the universal force of matter attracting matter; gravity is usually used to mean the pull of Earth or another planet on objects close to their surfaces—which is modified by the spinning of the planet. The whirling tends to throw all things out from the surface, thus countering, to some extent, the pull of gravitation.

Stronger than steel, gravitation is the force that holds the Earth together, the moon close to Earth, and all the planets in orbit around the sun. It has been estimated that a steel cable 5,000 miles thick would not be strong enough to hold Earth to the sun if gravitation somehow failed.

Although scientists as far back as Aristotle have investigated this force, there is no agreement on what causes it. We know that it becomes stronger when greater masses of matter are involved, and weaker the farther any two such masses are from each other. Einstein has suggested that there are gravitational fields similar to electromagnetic fields—but so far no experimental evidence has been found to support him.

is time between handicrafts and chores for worry; the concern is currently over

falling timber prices, brought on by the increased use of plastics.

The most famous product of the Schwarz Wald is the clock—first made here, it is believed, in the 17th century, in imitation of a model carried in by a peddler.

At first crude and one-handed, the design was refined over the decades. Metal works replaced hand-carved wooden gears, a pendulum was added, carved ornamentation added gaiety, and then some genius added a calling bird, and the cuckoo clock was born.

By the early 18th century, the cuckoo clock was delighting Europeans throughout the continent. Today's Black Forest families keep the tradition, working in living room-shops among a constant echo of ticking and clarion cuckoo calls. In a typical home "factory," below, Adolph Hettrich and his sister assemble 150 clocks a week. They work only part time among the gears and dials; they must also tend their farm.

The soil is poor here, and grazing is the chief farm activity. From the valleys where the farmhouses nestle, the pale-brown cows are driven to pastures on the steep hillsides.

Rains that green the pastures and the woods run off into two of Europe's major rivers. The Rhine forms a right angle around a corner of the Black Forest, marking the boundaries of France on the west and Switzerland to the south.

Near Triberg bubbles a spring honored with a brass marker: "Here spring the headwaters of the Danube River . . . at 1,078 meters [3,537 feet] above sea level." The small brook flowing away gathers strength from tributaries, becomes briefly the River Breg, and joins the Brigach to form the beautiful blue Danube at Donaueschingen.

NATIONAL GEOGRAPHIC PHOTOGRAPHER VOLKMAR WENTZEL. DR. PAUL WOLFF, ABOVE

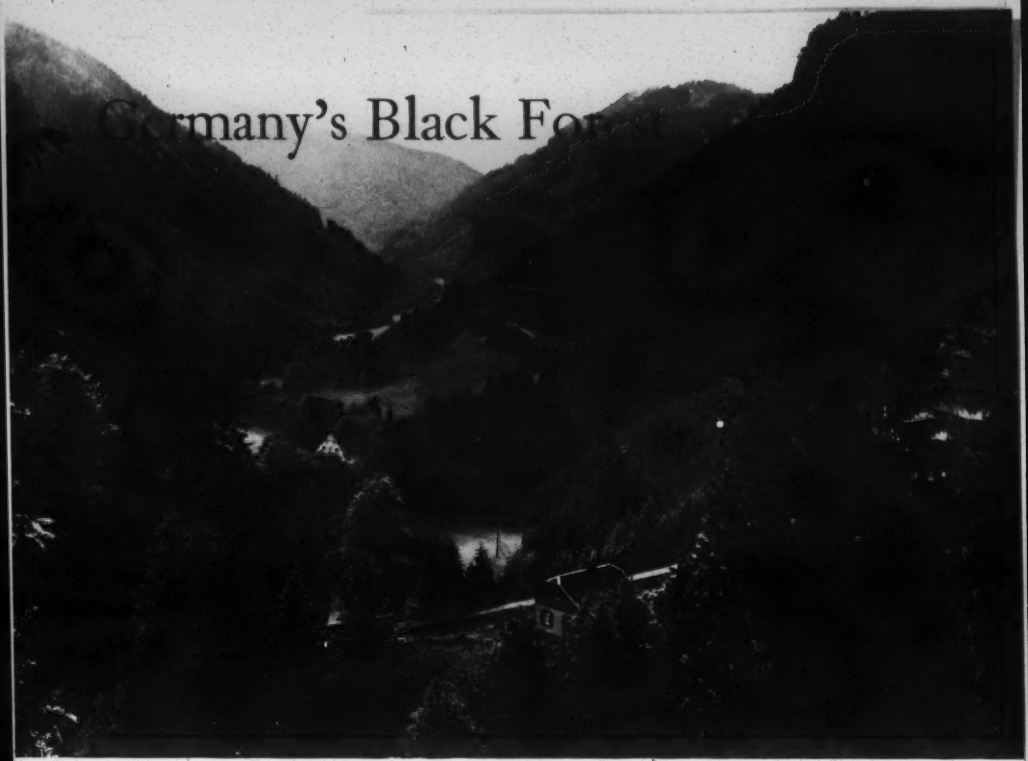
Black Forest water travels 1,725 miles across Europe, through eight countries, to lose itself, appropriately, in the Black Sea.

The people of the Black Forest have a reputation for thinking a lot and saying little. Pious Catholics, they may walk two or three hours to attend Sunday mass.

But they also enjoy merriment. Carnivals and festivals bring out splendid

UMI

Germany's Black Forest



KARL OBERT

Wooded mountains beside the Rhine
harbor a way of life
little changed by time

So much has been written about Germany's *Wirtschaftswunder,* the industrial miracle following World War II, that it is easy to overlook an older facet of the Fatherland, the rural, traditional areas symbolized by the Black Forest.

This region, a low mountain range rising beside the Rhine in the southwest corner of the Federal Republic, has felt slight effects of modernization, but still clings, in most things, to the age-old ways. Factories have come here—but they are more likely to employ five or ten workers than five or ten thousand. This is still a land of thatch-roofed houses, sheltering both families and their livestock, of handmade music boxes, of gay costumes whose origin was so long ago that it has been forgotten.

Girls walk to the village school, their books and lunches in gaily embroidered knapsacks (below). Here brooding mountaineers, often snowbound in the colder months, pass the winter carving cuckoo clocks. If "der elves" ever come out of "der forest" to help fill a production quota, it is surely somewhere in this neck of the woods. The chief wealth is still in timber—the spruces, pines, firs, beeches, and birches that grow so thickly they shut the light from the forest floor, giving the area its name—in German *Schwarz Wald.*

Although the woods—such as the *Höllental* above—seem wild, they are as carefully tended as any Iowa cornfield. Scientific forestry, relatively new in the United States, has been practiced in Germany since the 14th century.

The farmer may keep a few cows, or rent rooms to tourists, but his chief income is from his trees. Large landholders are thought of as millionaires—and may well be—but even the smallest farm boasts some woods, if only a few acres. If there is time between handicrafts and chores for worry, the concern is currently over

Preparing for festival—Frederick Dick chisels out a traditional mask for the Black Forest's *Schuddig* festival. From seasoned linden or poplar he creates witches, devils, and historical characters. Excellent disguises, the masks muffle the wearers' voices, making revelers sound as well as look alike.

Eight days of carnival merrymaking feature masks and colorful costumes. The bells make a racket designed to chase away evil spirits.

NGS PHOTOGRAPHER VOLKMAR WENTZEL, ABOVE

old costumes, singing societies, and brass bands. Folk dances include variations on the Maypole dance and a number that begins as a waltz, turns into a fast-step, and ends with the boy hoisting his partner high into the air.

In addition to the attraction of a lovely countryside supporting a colorful way of life, the Black Forest also lures visitors with promises of health.

Near its northern edge is the famous spa of Baden Baden. Many hot springs rise in and around the city, offering mineralized water at temperatures up to 154 degrees. Drinking or bathing in these waters is supposed to improve health—and thousands of visitors have come to receive their benefits.

Except under the thick trees, the Black Forest is far from black.

Travelers delight in the endless variety of greens in the foliage, contrasted with the bright emerald of grass. Flashing waterfalls punctuate mountainside streams alive with trout; wildflowers of every hue line roads and water. Reddish-brown farmhouses dot the valleys.

The people themselves add bursts of color with elaborate costumes that enliven carnival time (above) and smaller celebrations, especially the day-long wedding feasts for which much heirloom clothing comes out of storage. F.S.

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